MODEL III

BASIC
TAPE
INSTRUCTION
COURSE

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Radio Shack TRS-80 SOFTWARE ™

BASIC Tape
Instruction Course

Important Information for Cassette Users

Note: Model III BASIC on the TRS-80 Model III is essentially the same as Level II BASIC on the TRS-80 Model I. All of the following references to Level II BASIC also refer to Model III BASIC. The only difference is that a higher baud rate for saving onto tape can be set if you have a Model III with Model III BASIC (high = 1500 and low = 500). Both low and high baud rate use the same volume setting on the Model III.

Using Your Cassette Deck

Many factors affect the performance of a cassette system. The most significant one is volume. Too low a volume may cause some of the information to be missed. Too high a volume may cause distortion and result in the transfer of background noise as valid information.

Four different cassette models have been supplied with the TRS-80 system — the CTR-40, CTR-41, CTR-80, and CTR-80A. Each model has its own loading characteristics. The table below gives the suggested volume ranges for each of the CTR models.

Notice that the volume ranges for Level I and Level II are different. This is because the Level II data transfer rate is faster (500 baud vs. 250 baud). Also, notice that for the TRS-80 Model I, pre-recorded Radio Shack programs need a slightly higher volume setting than that required by your own CSAVEd tapes. This is because the pre-recorded tapes are produced with high-speed audio equipment at a slightly lower volume level than the CSAVE process provides. The Model III records at a lower volume than the pre-recorded tapes are recorded at, so the volume setting for user-generated tapes is higher than for pre-programmed tapes. You will need to take this into account when CLOADing Level II programs into a Model III.

Recorder Model	User-Generated Tapes		Pre-Recorded Radio Shack Tapes	
	LEVEL I	LEVEL II	LEVEL I	LEVEL II
CTR-40	YELLOW LINE	RED LINE	YELLOW LINE	RED LINE
CTR-41	6-8	4-6	6.5-8.5	5-7
CTR-80 & CRT-80A	4.5-6.5	3-5	5.5-7.5	2.5-5

Recommended Volume Settings for Radio Shack Cassette Decks When Used with the TRS-80 Model I

Recorder Model	User-Generated Tapes	Pre-Recorded Radio Shack Tapes
CTR-80, CTR-80A	5-7	4-6

**Recommended Volume Settings for Radio Shack Cassette Decks
When Used with TRS-80 Model III**

(With the CTR-40, CTR-80, and CTR-80A, turn the control to the left to increase volume. With the CTR-41, turn the control to the right.)

When information is being loaded from the cassette tape, two asterisks will appear on the screen. The one on the right will flash on or off as the program is read in. If the asterisks do not appear, or the one on the right does not flash, then the volume setting is probably too low. Increase the volume and try again. If you have a Model III this may be an indication that the tape's baud rate is different than the Computer's baud rate. (All Radio Shack Model I Level II pre-recorded cassettes are recorded at 500 baud rate, so Low baud rate must be selected when they are loaded on the Model III.) Try resetting the baud rate from high to low or vice versa (See your Operation Manual).

Use the reset button to stop the cassette and return control to you if loading problems occur.

Radio Shack programs are recorded at least twice on each tape. Following this practice when you record programs on tape will give you a back-up if one does not load properly or if it becomes damaged.

Important Note: The CTR-41 requires that you keep the supplied "dummy plug" in the **MIC** jack at all times. However, the other models should never be used with the "dummy plug."

Level I

Sometimes you will get an error message during an attempted CLOAD. This means that some information was lost or garbled. Adjust the volume level slightly and try again.

Level II (Also Model III BASIC)

In case of an error message, proceed as above. In Level II, there is also a rare case in which the program is not loaded correctly even though no error message is generated. So, after CLOADing a program, be sure to LIST it. If some data was garbled, then at some point in the listing the display will be filled with meaningless words and characters. Adjust the volume and try again.

Hints and Tips

Computer tapes should be stored in a relatively dust-free area (a cassette case is recommended) and protected from high temperatures. Magnetic and electrical fields may alter recorded information, so avoid placing the tape near them

(i.e. household appliances, power sources such as transformers and television sets, etc.).

The cassette deck supplied with the TRS-80 is very compatible with the system and will perform its duties with great success. To keep the cassette deck in top condition and thus minimize your problems, you should periodically perform some routine maintenance on it. Dirty heads can cause as much as a 50% loss of volume. Also, heads become magnetized with use and may cause distortion. We recommend that you clean the head, capstan, and pinch roller after every four hours of operation. Heads on new recorders should always be cleaned before use.

Note: Cassette cleaning and demagnetizing accessories are available from your local Radio Shack store.

Model III BASIC Tape Instruction Course

Additional Information on Loading Lessons

Each lesson or sub-segment may be studied or reviewed at any time. To stop a lesson, or go to a sub-segment, press the (BREAK) key. When READY>__ appears, type: (C)(L)(O)(A)(D) and press (ENTER). The next sequential sub-segment will load.

After the computer has loaded the lesson or sub-segment, READY>__ will appear again. Either type: (C)(L)(O)(A)(D) and press (ENTER) again (to advance to the next sub-segment) or type: (R)(U)(N) and press (ENTER) to run the program. You must press (ENTER) after responding to questions that appear on the screen.

Note: The lesson name is not required when using the CLOAD command. It is given for reference purposes only.

Table of Contents

* * * IMPORTANT NOTICE * * *

This program is designed for use only with the Model III Computer. It will not
work on the Model I Computer. The tapes included in this package are recorded
at the High 1500 Baud rate, which will only load on a Model III. (See Loading
Instructions.) Do not try to use this program on a Model I.

Introduction

The BASIC Course consists of Model III tapes which contain a beginning course
in Model III BASIC. This course does not assume any previous experience with
BASIC.

The lessons are designed so that you will be able to write simple programs
within a matter of minutes. By using the BASIC Course and your Model III
Operation and BASIC Language Reference Manual, you should be able to write
programs in BASIC. This BASIC Course is intended as a primary aid in learning
BASIC.

The computer offers a unique advantage as an educational tool. Each lesson is
self-pacing, interactive, and dynamic. It is not like reading a book; you literally
talk back to the computer as you learn. You can progress as fast or as slow as
you wish. Graphics, animation, and readability make this approach to learning
BASIC fun.

During each lesson, there are quick tests to help you gauge your progress. Unlike
written tests, the computer will explain why a particular answer is wrong. At the
end of each lesson, and before each test, the program will ask if you wish to
repeat the last lesson.

The Lessons

The BASIC Course consists of eight Lessons and an Introduction. The Introduction explains how to load and use each Lesson. Some Lessons are made up of smaller sub-segments, such as LESSON1, L1P2 (Part 2 of Lesson 1), L1P3 (Part 3 of Lesson 1), L1P4 (Part 4 of Lesson 1), etc.

Each Lesson or sub-segment may be studied or reviewed at any time. To stop a Lesson, or go to a sub-segment, press the [BREAK] key. When READY>__ appears, type [C][L][O][A][D]["] and the name of the desired lesson or segment. After the computer has loaded the lesson or segment, READY>__ will appear again. Type: [R][U][N] and press [ENTER] . You must press [ENTER] after responding to questions that appear on the screen.

Lesson 1

Lesson 1 (Beginning BASIC) is essentially your introduction to the world of computers. It explains the way BASIC works, the use of line numbers, and how BASIC programs are structured. Loading instructions and their contents are as follows:

[C][L][O][A][D]["][L][E][S][S][O][N][1]["]   [ENTER]

Introduction	Line Numbers	INPUT
LIST	Variables	Line Editing
PRINT	NEW	Tape Storage
CLOAD		

[C][L][O][A][D]["][L][1][P][2]["]   [ENTER]

PRINT Spacing	PRINT@	END
Expressions	Hierarchy	LET
PRINT TAB	Strings	

[C][L][O][A][D]["][L][1][P][3][ ]   [ENTER]

IF/THEN	Operator Meanings	GOTO
READ/DATA	Arrays	DIM
FOR/NEXT	Looping	

3

CLOAD "L1P4" ENTER

ABS	INT	RND
GOSUB/RETURN	ON...GOSUB	ON...GOTO
RESTORE		

Graphics Statements:

| SET | RESET | POINT |

Lesson 2

Lesson 2 shows you how to make changes to programs, using the Editing functions and the Editing commands. Lesson 2 also covers shortcuts in Editing that let you make changes quickly and easily.

CLOAD "LESSON2" ENTER

Using Edit	LIST	EDIT
SPACE BAR	D elete	I nsert
SHIFT UP ARROW	CURSOR MOTION	S earch
H ack	X (end of line)	K ill
C hange	L ist edited line	A (cancel)
Q (quit and exit)	E (save and exit)	

Lesson 3

Lesson 3 covers the different types of variables and variable names allowed in BASIC. The lesson explains in detail how to use the most efficient type of variable for any application. Lesson 3 also examines the use of arrays to hold large quantities of related information.

CLOAD "LESSON3" ENTER

Integer	Single Precision	Exponential Form
Double Precision	Strings	Type Declaration
Arrays	DIM	

Lesson 4

Lesson 4 details the use of BASIC Operators and Commands. The operators (arithmetic and logical) and their use are explained in full. The BASIC Commands are listed and explained.

C L O A D " L E S S O N 4 " [ENTER]

Operators

Arithmetic Operators:

Addition	Subtraction	Multiplication
Division	Exponentiation	Grouping

Relational Operators:

Less Than	Greater Than	Equal to
Less Than or Equal	Greater Than or Equal	Not Equal to

Logical Operators:

True Expression	False Expression	AND
OR	NOT	

String Operators:

+ (Plus)	Less Than	Greater Than
Equal to	Less Than or Equal	Not Equal to
Greater Than or Equal		

Operator Hierarchy

Commands

AUTO	CLEAR	CSAVE
CLOAD?	CLOAD	STOP
CONT	SYSTEM	TRON/TROFF

Lesson 5

Lesson 5 explains how to enter and store data, and retrieve it. Saving data on tape for later use is covered in detail.

C L O A D " L E S S O N 5 " [ENTER]

INPUT	Input/Output (I/O) Statements	
INP	INPUT#	INKEY$
PRINT@	READ	PRINT
LPRINT USING	PRINT USING	LPRINT
# Field Specifier	PRINT#	OUT
! and % Field Specifiers		

C L O A D " L 5 P 2 " [ENTER]

Input/Output (Cont.)	LPRINT	LPRINT USING
LLIST	Cassette Data Files	PRINT#
INPUT#	INP	OUT
INKEY$		

Lesson 6

Lesson 6 explains how to manipulate text strings and use them for comparisons and logical operations.

C L O A D " L E S S O N 6 " [ENTER]

String Functions:

ASC	CHR$	FRE
LEN	LEFT$	MID$
RIGHT$	STR$	STRING$
VAL		

String Operations:

ASCII Codes	ASCII Function	CHR$ Function
Relational Operators	LEFT$ Function	MID$ Function
RIGHT$ Function	LEN Function	VAL Function
STR$ Function	FRE Function	

Lesson 7

Lesson 7 details the special features of Model III BASIC and how to use these features.

C L O A D " L E S S O N 7 " [ENTER]

? (PRINT)	' (REM)	Compact Lines
NEXT	Ending Quotes	IF...THEN...ELSE
ON ERROR GOTO	RESUME	ERROR Statement
ERR Function	ERL Function	

C L O A D " L 7 P 2 " [ENTER]

Special Character Set   Special Options

Lesson 8

Finally, Lesson 8 completes the course with a section on machine language subprograms that are called from a BASIC program.
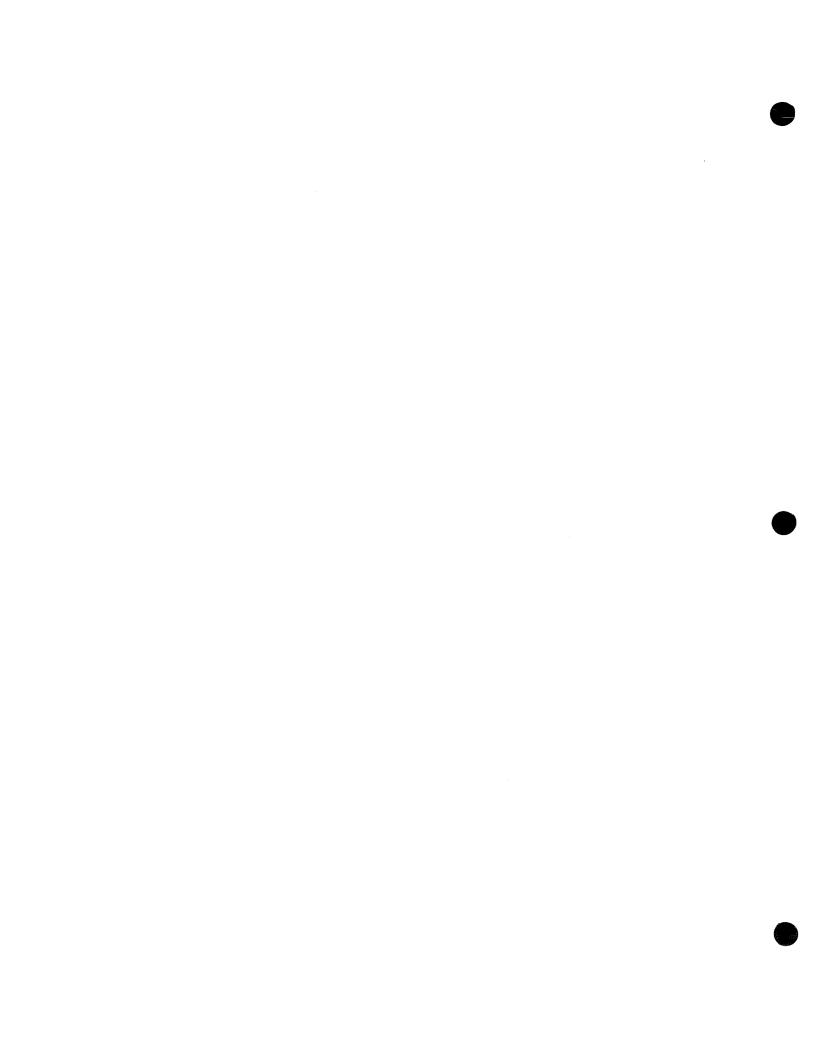

C L O A D " L E S S O N 8 " [ENTER]

| Machine Language | SYSTEM Command | PEEK |
| POKE | USR Function | VARPTR Function |

Loading the Lessons

It is assumed you have reviewed the general operational procedures for your equipment as explained in the Model III Operation and BASIC Language Reference Manual and are now aware of how to power on your computer, load tapes, etc.

1. Turn on the system. If you are not familiar with the Model III System, please refer to your Model III Operation and BASIC Language Reference Manual for System Start Up (Power Up Sequence).

2. **The screen will show:**   **You type:**

   Cass?   H and press ENTER .

   Memory Size?   Press ENTER .

   READY>__   C L O A D " I N T R O "
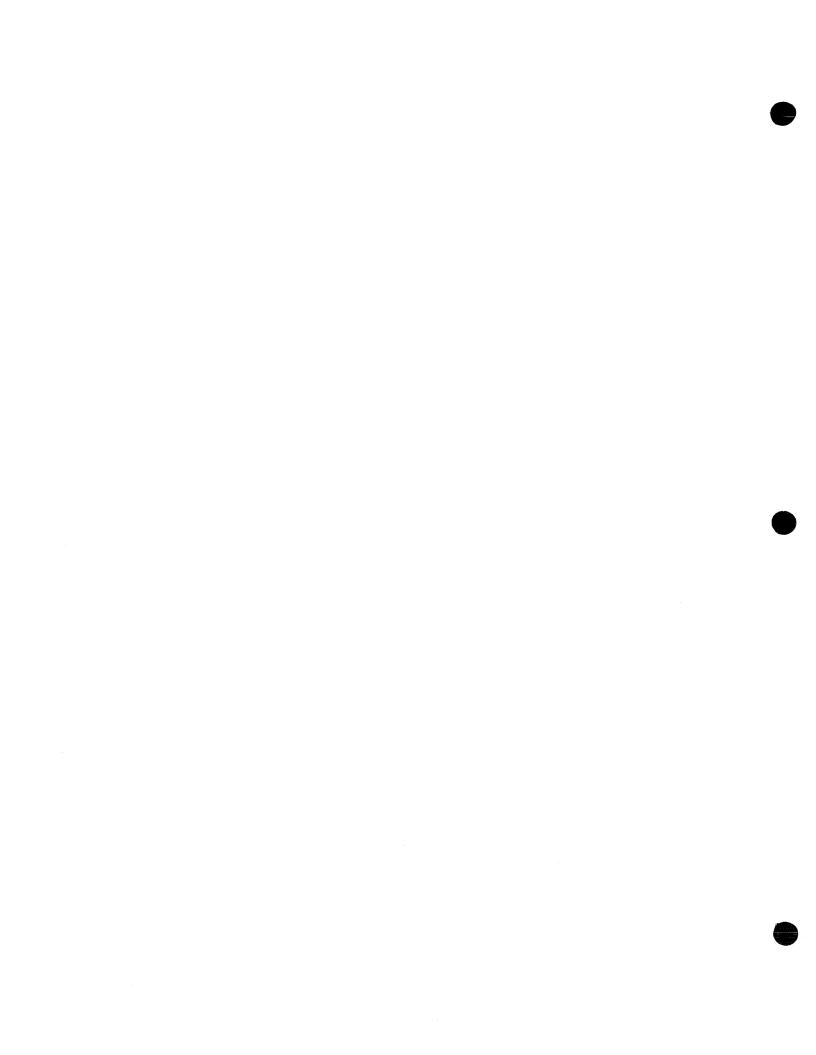   and press ENTER .

   After the lesson has loaded into the computer, READY>__ will appear again.
   Type: R U N and press ENTER .

   The Introduction has detailed instructions on using the program and loading the lessons.

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NOTE: Good data processing procedure dictates that the user test the program, run and test sample sets of data, and run the system in parallel with the system previously in use for a period of time adequate to insure that results of operation of the computer or program are satisfactory.

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